8. Solid cartridge heaters are available with various power levels in the same cylindrical geometry. A conveniently located bulkhead plate with a threaded port is used to mount the solid cartridge heater in the air distribution system. This provides the press operator with a means to readily change out solid cartridge heaters with different power levels for different processes and application.

9. The effective drying temperature of the dryer is measured using a temperature sensor that is mounted to a metallic slide plate that is in contact with the web. The temperature of the metallic slide plate essentially stabilizes at the temperature of the web, due to the contact with the web, and will provide the operator with a more accurate measurement of the effective drying temperature of the process. This can greatly reduce set up time and maintain quality on repeat jobs.

10. Solid cartridge heaters are available with variable power densities along the axial length of the solid cartridge heater. The variable power densities can be used to create hot or cold spots in specific intervals or in specific areas along the width of the dryer to counteract uneven flow patterns past the solid cartridge heater or to meet specific process or application requirements.

The particularly novel features of the invention can be summarized as:

1. The preferred embodiment utilizes a solid heating cartridge within a specially designed air distribution system to raise the temperature of the forced air just before it discharges.
2. A self-contained forced hot air drying unit for the printing, painting and coating industries that fully integrates the air handling equipment, heat plant, air flow control and air temperature control into a single compact package.
3. Effective drying temperature is monitored by measuring the web temperature.

CLAIMS

1. A forced hot air drying unit for drying inks, paints or coatings comprising of:

an air distribution system having a housing, an inlet cavity, a baffle, air passages, a single or multiple orifice chamber(s), and a series of orifices allowing air to pass from the said orifice chamber(s) to the exterior of the said housing of the said air distribution system

a said air distribution system having an internal construction capable of accepting an electrical heater which allows heat to be efficiently conveyed from the said electrical heater through the said internal construction to the air as the air passes from the said baffle to the said orifices.

a said electrical heater mounted within the said internal construction of the said housing of the said air distribution system

2. A forced hot air drying unit for drying inks, paints and coatings comprising:

a source of pressurized air

a source of electrical power

a means for distributing air from the source of the said pressurized air to single or multiple said housing(s) of the said air distribution system(s)

a means of heating the air within the said housing, including a said electrical heater mounted internally within the said air distribution system, that heats the said internal construction of the said air distribution system, that heats the air as it passes from the said inlet cavity to the said orifice chamber(s) of the said air distribution system.

a means of controlling the flow of the air passing through the said air distribution system(s) out through the said orifices to the exterior of the said air distribution system(s), the preferred controlling means including an air flow regulator.

a means of controlling the temperature of the air passing from the said inlet cavity through the said orifices to the exterior of the said air distribution system(s), the preferred means including a modulating power electronic temperature controller.

an enclosure containing the assembly of said air distribution system(s), said electrical heater(s), said means of controlling air flow, and said means of controlling air temperature

3. A means of monitoring the effective temperature of a forced hot air drying unit for drying inks, paints of coatings comprising of:

a thermocouple mounted to a thermal conducting slide plate in contact or supporting the materials being dried.

the thermocouple mounted in a location where the material being dried has already been exposed to the majority of the resident time of the drying unit.

the thermocouple being capable of attaining the temperature of the material being dried.

4. The dryer of claim 1 in which said heater comprises of a solid cartridge type heater that may vary in material composition, diameter, length and wattage.

5. The dryer of claim 1, in which said heater can be constructed with variable power density to provide an equal temperature profile along the axial length of said housing.